

### **REMARKS**

Claims 1-33 are pending herein, claims 1, 30, 31 and 33 being independent. Claims 3-5, 9, 15-23, 25, 26 and 28-33 have been withdrawn. No new matter has been added.

In the pending Office Action, the Examiner has rejected claims 1, 2, 6, 7, 10, 11, 13, 14, 24 and 27 under 35 U.S.C. § 103(a) as obvious over WO 00/40886 (Baylot) in view of United States Patent No. 4,162,093 (Sigmund); claim 8 under 35 U.S.C. § 103(a) as obvious over Baylot in view of Sigmund in view of United States Patent No. 6,000,438 (Ohm); and claim 12 under 35 U.S.C. § 103(a) as obvious over Baylot in view of Sigmund and in further view of United States Patent No. 6,703,127 (Davis, *et al.*). Applicants have carefully considered the Examiner's rejections, and the comments provided in support thereof, and respectfully disagree with the conclusions reached by the Examiner. For the following reasons, applicants respectfully submit that the claims present allowable subject matter in light of the references applied by the Examiner, and therefore solicit the early allowance thereof.

The following description of the invention is provided for the convenience of the Examiner and is taken from the specification. It is not intended to argue limitations not present in the claims, or to argue for an interpretation of any claim term that is other than what would be ascribed to such term by one of ordinary skill in the art upon a full and fair reading of the specification as a whole.

The invention is directed to a device for thermally insulating an undersea pipe, the device comprising at least one container holding a phase change material ("PCM") within the pipe. The device further includes a deformable thermally insulating covering that surrounds the pipe. The covering is covered by an outer case that remains in contact with the outside surface of the insulating covering when it deforms. One way the invention differs from the prior art is that the

PCM is held within the at least one container, a feature shown nowhere in the art applied by the Examiner.

In the specification, applicants addressed the Baylot patent (the U.S. equivalent of which is United States Patent No. 6,978,825 – to which reference is made herein for the Examiner's convenience), and the differences to be drawn between Baylot and that of the instant invention. That description begins in para. [0019] of the published application herein.

As described, the difference is that, in Baylot, insulation is provided by a PCM that is impregnated in an absorbent matrix 2 (*see, e.g.*, col. 8, lines 63-65 of Baylot). Matrix 2 is described as follows:

“[M]atrix 2 may be constituted by a light cellular or fibrous material such as open-cell foam, particularly polyurethane foam, glass or rock fiber, woven fabrics, felt, paper, etc . . . : in fact, the nature of the material constituting said matrix *must be* sufficiently absorbent to be compatible with the impregnation by said phase change material 4 in order to oppose the natural convection of the liquefied part 4<sub>1</sub> of said material . . .” (emphasis supplied) – col. 9, lines 20-26.

This differs markedly from the claimed construction which requires the confinement of the PCM in a *container* disposed around the pipe. Baylot fails to teach or suggest the use of such a container, and it is the inventors' contribution to the art to recognize the benefit of having the PCM *not* impregnated in a matrix (which impedes its ability to flow) but instead be in a container. There is an additional benefit, as explained in para. [0028] of the published specification herein, namely that when a PCM is loaded into a matrix, as in Baylot, it must be loaded in a fluid form so that it will flow into the matrix. This means that it must be handled *hot*, or else the PCM will not flow. As the PCM is injected into the matrix within the pipe, the PCM tends to cool and therefore harden, leading to the possibility of a discontinuity of the flow of the PCM into the matrix, and ultimately the provision of uneven insulation to the pip when *in situ*. According to the invention, on the other

hand, loading the PCM into containers which may be simply placed within the pipe makes the loading of the PCM much easier and ensures more even distribution of the PCM in place for smooth operation of the pipe while in use. This construction also avoids the possibility of gaps or voids that may accompany the distribution of the PCM within the matrix of the prior art.

Thus, the invention as claimed is distinct from the device taught in the prior art Baylot patent. The Examiner has apparently conceded this distinction, as he has relied on the teachings of the Sigmund patent to overcome the deficiencies of the prior art Baylot patent. It is also pointed out that Baylot *expressly* states that the matrix “*must be*” absorbent, and therefore teaches *away* from the use of a container, which, by its very terms does not absorb the PCM but rather holds it in place.

The addition of Sigmund overcomes none of the deficiencies, however, of Baylot. Sigmund discloses an insulated pipe having insulating *coatings* 91, 92, 103 and 110 (it is noted that the Examiner also referred to a reference numeral 90 but that numeral does not seem to be used in Sigmund), and the Examiner has relied on the use of these *coatings* to teach the use of “containers”. The Examiner does not, however, provide any explanation of how teaching the use of a “coating” would lead one of ordinary skill in the art to use a “container”. A “coating” is simply something applied to the exterior of another object, while a container is something that holds something else. In this context, the claimed insulated pipe includes a container for holding a PCM used in the device, while Sigmund teaches applying a coating to a pipe to insulate it. Although the Examiner states, without support: “[I]t would have been obvious to one of ordinary skill in the art to modify the insulation in Baylot by providing coating layers to act as flexible containers for the insulation layers as suggested by Sigmund . . .”, the Examiner offers no basis for the proposition that one of ordinary skill in the art would be motivated to modify the combination of Baylot and Sigmund

posited by the Examiner so as to include containers, a feature which is lacking in *both* references and that is directly contrary to the express teaching of the prior art Baylot patent that the PCM *must* be held in an absorbent matrix.

It is not seen how one of ordinary skill in the art could combine two references that *lack* containers for holding a PCM, and *must* include an absorbent material to hold the PCM, to yield a device that *has* a container and no absorbent material. Without some teaching in the prior art of how or why such a modification could be made, the proposed primary combination fails to teach or suggest the invention as claimed herein.

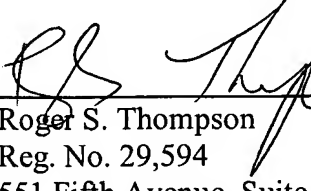
The other references applied by the Examiner likewise fail to teach or suggest the use of containers to hold a PCM, and the Examiner has not offered those references for that proposition. Accordingly, it is submitted that the invention as claimed is distinct from the references applied by the Examiner, taken alone or in combination. There being no further grounds for objection or rejection, early and favorable action on the presented claims is solicited.

Furthermore, since claim 1 is generic to the inventions disclosed, the allowance of claim 1 makes the remaining claims subject to rejoinder, and therefore allowance as they each contain the limitations of claim 1. MPEP § 821.04.

It is believed that no fees are due at this time. However, in the event that any fees are required, please charge any such fees or charges required at this time in connection with the application to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,  
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